WATER CONSERVATION NEWS

"building sustainability, reliability, and accountability through efficient water use"

In this issue...

Agricultural Water Management Council: *Progress and Challenges*

by Roger Reynolds and Richard Roos-Collins, Co-Chairs

July 1999 marked the second anniversary of the formation of the California Agricultural Water Management Council. The Council was formed in accordance with the Memorandum of Understanding (MOU) Regarding Efficient Water Management Practices (EWMPs) by Agricultural Water Suppliers In California (AB 3616). Many dedicated individuals worked hard over several years to develop a reasonable list of Agricultural Efficient Water Management Practices, the MOU, and the governing structure for the Council.

The purposes of the MOU are:

- to create a constructive working relationship between agricultural water suppliers, environmental interest groups, and other interested parties;
- to establish a dynamic list of EWMPs;
- to establish criteria to evaluate the appropriateness of EWMPs; and
- to implement appropriate EWMPs while avoiding unnecessary or unreasonable planning, paperwork, or expense for water suppliers, thereby voluntarily achieving more efficient water management than currently exists or may be required by existing law.

The Council is co-chaired by one representative each from the agricultural and environmental signatories to the MOU.

The Council has continued to grow since its formation. It was formed with only 17 water suppliers as signatories representing approximately 1.8 million acres of irrigated agriculture. Now, two years later, the Council has 45 agricultural water suppliers representing nearly 4.6 million acres of irrigated agriculture in California, 3 environmental interest groups, and more than 40 other signatories representing other public and private interests.

All signatories to the MOU become members of the

(continued on page 4)

CIMIS

Using the new CIMIS ETo zone map to develop a "normal" year turf irrigation schedule. See page 20 for more details.

Water Conservation News provides information on water use efficiency developments. This free newsletter is published quarterly by the California Department of Water Resources, Division of Planning and Local Assistance, Water Use Efficiency Office.

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Water Use Efficiency Office
(916) 327-1655

Baryohay Davidoff
California Irrigation Management
(916) 327-1788

Greg Smith
Local Planning Support
(916) 327-1619

Keith Watkins
Management Practices and Outreach
(916) 327-1808

Water use efficiency information is also available from the following DWR district staff:

X. Tito Cervantes—Northern District
2440 Main Street
Red Bluff, CA 96080-2398
(530) 529-7389

Ed Morris—Central District
3251 S Street
Sacramento, CA 95816-7017
(916) 227-7578

David Scruggs—San Joaquin District
3374 E. Shields Avenue
Fresno, CA 93726-6990
(559) 445-5262

David Inouye—Southern District
770 Fairmont Avenue
Glendale, CA 91203-1035
(818) 543-4600

We welcome comments, suggestions, and story ideas. Please send them to:

Water Conservation News Editorial Staff
Department of Water Resources
Division of Planning and Local Assistance
P. O. Box 942836
Sacramento, CA 94236-0001

Telephone: (916) 327-1685
Fax: (916) 327-1815
E-mail: **kanter@water.ca.gov**

DWR does not endorse any of the businesses or consulting firms mentioned in this newsletter, since there may be others that offer the same or similar services.

Water Conservation Office a has new name

The Water Conservation Office is now the "Water Use Efficiency Office." As the area of efficient water use expands to include more programs (such as water recycling and agricultural drainage water management), the new name will represent all aspects of efficient water use—in addition to water conservation.

Mission Statement of the Water Use Efficiency Office

"To advance the efficient management and use of California's water resources in cooperation with other government agencies and the private sector through technical and financial assistance."

CII 38th Annual Meeting

Irrigation in the 21st Century:

Who are the Players?
What is the Game?

Mark your calendar for the 38th Annual Meeting of the California Irrigation Institute, Inc. to be held **January 24-25, 2000** at the Radisson Hotel in Sacramento, California. The conference will address concerns about the future of irrigation in California of interest to growers; landscape irrigators; decision makers at all levels of government; water, reclamation, and flood control agency directors, managers, and staff; planners; business, agricultural, and environmental leaders; educators; technical experts; and consultants.

Don't miss out on an opportunity to:

- learn about the roles of the California Urban Water Conservation—and Agricultural Water Management—Councils and the implications for irrigation's future
- join the debate on how to evaluate irrigation efficiency: what are the BMPs, EWMPs, and who says so?
- find out how water suppliers can meet growers' changing needs, and improve water delivery measurement.
- look at new products, learn about new services, and talk to the experts using them
- meet Tom Hannigan, new Director of the California Department of Water Resources and opening speaker
- earn Certified Crop Advisor and Irrigation Association continuing education credits.

Registration

Preregistration (**by January 10**) is $120; registration after January 10 is $150; student (full time) registration is $25; and exhibitor registration (includes 1 registrant) is $300. Registration includes admission to all sessions, refreshments, the reception on January 24, and lunch on both days. **No registration refunds after January 14.**

To register, please send a check payable to **CII** to: William I. DuBois
1127 11th Street, #626
Sacramento, CA 95814

Room reservations should be made directly with the Radisson Hotel, Sacramento, at (916) 922-2020. Mention the CII conference for the special rate of $89 single or double.

Agricultural Water Management Council:
Progress and Challenges *(continued from page 1)*

Council and make a commitment to support a good faith effort to voluntarily review and advance efficient agricultural water management.

The Council is a California Nonprofit Benefit Corporation with a Board of Directors elected by the members. We hope that the nonprofit status will encourage other interested parties and charitable foundations to make donations in support of the Council's efforts. While the initial formation of the Council and implementation of the MOU continues, there is more work to be accomplished.

Some practices are considered Generally Applicable and all water supplier signatories to the MOU have made a commitment to implement them.

For example, all water suppliers are required to prepare a WMP, designate someone as a water conservation coordinator, and support the availability of on-farm water management services.

These may include irrigation and drainage management evaluations, normal year and real-time irrigation scheduling, and crop evapotranspiration information and educational programs for farmers, etc.

Agricultural signatories have made a voluntary commitment to:

1. implement generally applicable Efficient Water Management Practices (required of all water supplier signatories)
2. prepare comprehensive Water Management Plans (WMPs)
3. use a comprehensive Net Benefit Analysis (NBA) methodology to evaluate the benefits of implementing each Efficient Water Management Practice
4. identify appropriate Efficient Water Management Practices for implementation
5. implement all appropriate Efficient Water Management Practices on a timely schedule

Where appropriate, water suppliers are also encouraged to improve communication and cooperation regarding existing water management policies, and to make changes to further improve flexibility in water supply management.

The Council, with the Department of Water Resources and others, has developed a comprehensive Net Benefit Analysis (NBA) to evaluate the benefits and costs of implementing each practice included in WMPs.

The NBA takes into account the technical, socioeconomic, financial, and environmental factors in evaluating the appropriateness of implementing each practice.

Several WMPs have been submitted to the Council and additional plans will be received in the future.

As provided in the MOU, DWR continues to provide administrative and general

office support for the Council. This assistance has been a tremendous benefit to the Council.

The submission of WMPs, however, now moves the Council into a new and challenging role. This will require the Council to review and endorse the WMPs, and oversee the implementation of appropriate efficient water management practices by water suppliers.

The Council has developed a process to review and endorse water management plans. This process will serve as a guideline for the technical review by DWR staff. DWR will review and evaluate each WMP and Net Benefit Analysis. DWR staff will communicate their initial findings/ comments on the WMP with each water supplier and will get more information if required.

DWR will prepare a summary report to the Council. This report will include a review of the Net Benefit Analysis for applicable efficient water management practices.

The report will include a discussion of the adequacy of each WMP submitted listing the strengths and weaknesses or clarifications as needed.

The Council wants the DWR review process to be completed within a six-month period following the water supplier's submission of a WMP.

The Council will then appoint a subcommittee, composed of water suppliers and interested environmental signatories to the MOU, to review the WMPs and DWR summary reports. The subcommittee will meet with the water suppliers to review the findings and reports.

At the conclusion of the review, the subcommittee will vote to submit the WMP to the Council with a recommendation for a vote of endorsement by the Council, or to resubmit the WMP to the water supplier for further modification.

Following endorsement of the WMP by the Council, the water supplier will begin implementation of the plan and report biennially on the progress made.

The Council, recognizing the importance of its role in advancing and encouraging efficient water management in California and in the many other statewide processes related to water management, invites all water suppliers and other interested parties who have not yet signed the MOU to join the Council and support its voluntary water management process.

Additional representatives of the environmental community are encouraged to join the process, and become active partners with the agricultural community in helping advance the cooperative efficient water management program envisioned by the MOU.

The Council provides an open forum for all signatories to work in good faith with one another on appropriate water management issues. For more information please call us at (559) 582-9237 or (415) 288-0550.

Drainage CONNECTION

Integrated On-Farm Drainage Management Workshops Offered

by Wayne Verill, Agricultural Drainage Program

In May and June 1999, the Department of Water Resources Agricultural Drainage Reduction and Reuse Program sponsored four workshops on Integrated On-Farm Drainage Management. The workshops were conducted by the California State University Fresno Center for Irrigation Technology.

IFDM is a system for the sequential on-farm reuse of subsurface drainage on increasingly more salt-tolerant crops. The remaining small volume of highly saline, concentrated drainage water is discharged to a small solar evaporator from where salt may be recovered for eventual beneficial use. IFDM has a number of intended benefits, including water conservation, on-farm salt, selenium, and boron management, and elimination of off-farm drainage discharge.

John Diener hosted a field day at his Red Rock Ranch in western Fresno County prior to the start of the workshop series. The farm has a fully operational IFDM system and has been the site of research and development by university scientists and government agencies (see the article on Selenium Management in IFDM Systems Through Volatilization in the July 1999 WCN). Diener discussed the history of the farm and IFDM implementation, including practical experience and advice to other growers considering starting IFDM systems.

One regional workshop was held in each of the four drainage impacted regions of the westside San Joaquin Valley: Kern County, Tulare/Kings County, Westlands area, and Grasslands area. Each half-day workshop had a similar format, but was designed to address the specific problems and drainage conditions of each region. Topics included system design, management of shallow water tables, salt-tolerant crop and tree selection, system operation and management, salt and selenium management, economics, and regulations and environmental issues. Speakers ranged from University and Cooperative Extension specialists to district representatives and local growers with first-hand experience with IFDM and other reuse systems. Regionally adapted manuals were distributed by CIT to workshop attendees. The workshops were usually followed by a lively discussion among participants and presenters concerning the many factors to be considered in IFDM implementation and management. Several growers expressed strong interest in establishing IFDM systems on their farms.

These workshops represent a milestone in the development of IFDM systems. Originally recommended as agroforestry systems for drainage reuse in the 1990 Drainage Management Plan known as the "Rainbow Report," the systems were untested and existed only as ideas on paper. Since then, three pilot projects have been launched, and much has been learned about the regional advantages and disadvantages of IFDM systems, and the special requirements of managing salt-tolerant crops and drainage reuse systems. Although a number of questions remain about long-term sustainability of soil quality, marketability of salt-tolerant crops, and commercial use of salt and selenium products, a number of successes have

been achieved, and a number possibilities exist for further developments. Perhaps most exciting is the interest shown by a leading medical research organization in the selenium-containing broccoli grown on Red Rock Ranch as a possible aid in the prevention and cure of cancer.

For the next three years, CIT will continue to present workshops in the westside SJV on developments in other technological and management advances in drainage reduction and water conservation.

For more information on the CIT workshop series, contact David Zoldoske, Director, CSUF Center for Irrigation Technology, 5370 North Chestnut Avenue M/S 18, Fresno, CA 93740-8021, (559) 278-2066, Fax (559) 278-6033, e-mail david_zoldoske@csufresno.edu. CIT is preparing workshop proceedings which combine the information presented at all four workshops. Visit the CIT Web site for more information at www.atinet.org/cati/cit.

Buena Vista Water Storage District Reverse Osmosis Plant to Test Desalting of Agricultural Drainage Water

The Buena Vista Water Storage District Reverse Osmosis Demonstration Plant Project is a pilot program designed to provide performance data and information for the design of a full-scale treatment plant. The project will be conducted near the town of Buttonwillow and consist of a 20 gallon-per-minute reverse osmosis unit with a multi-media filter as pretreatment. The unit will be fed brackish agricultural drainage water collected through subsurface tile drains.

The four project participants are the Department of Water Resources, Boyle Engineering Corp., University of California at Los Angeles, and the Buena Vista Water Storage District. Bloemhof Farms is supplying the drainage sump and subsurface collection system. The project has been partially funded and other interested parties are being sought.

The project will develop information about pretreatment, RO treatment, and brine disposal. Project goals include collecting the information needed to verify RO pretreatment data developed by the UCLA research team, addressing the overall salt balance issue (concentration and/or removal of salt for disposal or reuse), and providing information about the reuse of treated drainage water reducing the need for imported water.

The two-year project should be running by March 15, 2000. The first year (2000) would be used to calibrate the system and determine the necessary pretreatment processes. During the second year membranes and brine disposal would be evaluated. The treatment facilities would be operated during the seven months of the irrigation season with a treated water cost estimated at about $300 per acre-foot in addition to brine disposal and conveyance system installation costs. For further information contact Kurt Kovac, DWR San Joaquin District, Activity Manager, Drainage Water Monitoring and Evaluation & Drainage Water Treatment, (559) 230-3343; e-mail kkov@water.ca.gov.

Drainage
CONNECTION

Updating the 1990 Rainbow Report

by Manucher Alemi, San Joaquin Valley Drainage Implementation Program Coordinator

A federal/State interagency program published the *Management Plan for Agricultural Subsurface Drainage and Related Problems on the Westside San Joaquin Valley*, known as the "Rainbow Report," in 1990. In the nine years since the *Management Plan* was published, San Joaquin Valley districts and farmers have made substantial progress implementing several components of the *Management Plan*, specifically source reduction, modification of existing evaporation ponds and construction of compensatory/alternative waterfowl habitat, and implementation of the Grassland Bypass Project.

The feasibility of the *Management Plan's* other components such as drainage reuse are being tested in field demonstration projects. Several thousand acres of land on the westside of the Valley are planned for retirement, while shallow groundwater management has not been systematically implemented. At this time, only partial implementation of the *Management Plan* has been achieved.

The *Management Plan* states that "uncertainties in the scientific information base, plus difficulties in forecasting human events, necessitates that the *Management Plan* be updated from time to time as monitoring, additional studies, and local actions reveal new facts." In 1996, an association of water and drainage districts, the University of California, and the California Department of Food and Agriculture proposed an initiative to the interagency San Joaquin Valley Drainage Implementation Program Management Group. The Management Group, chaired by Department of Water Resources Deputy Director Raymond Hart, adopted the initiative as its Activity Plan in December 1996. The purpose of the Activity Plan is to review new information and to update the *Management Plan*.

In addition to updating the *Management Plan* implementation, the Activity Plan is intended to remove constraints to the *Management Plan* and to foster cooperation among university scientists, government agencies, environmental interests, growers, and other stakeholders in resolving long term drainage, salinity, and trace element problems with the goal of achieving agricultural and environmental sustainability in the Valley.

The Activity Plan has three stages. The first stage—updating the M*Management Plan*—consisted of two tasks. The first task was the technical and economic evaluation of seven drainage management options recommended in the *Management Plan*, with the addition of salt utilization, by seven technical committees: Drainage Reuse, Drainage Water Treatment, Land Retirement, Evaporation Ponds, Source Reduction, Groundwater Management, and River Discharge. The Management Group added an eighth technical committee to evaluate salt utilization. Technical committee members included university scientists, government agencies, and stakeholders.

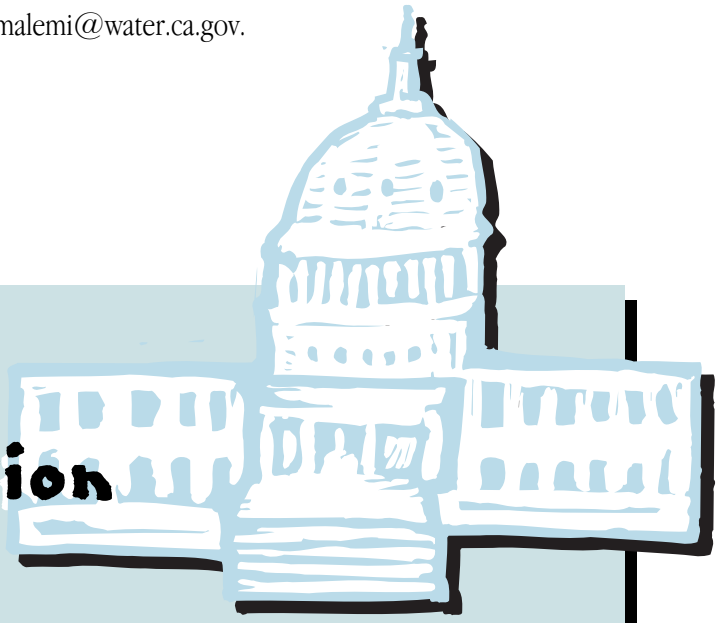
The second task was the preparation of reports on the status of drainage problems by representatives of water

and drainage districts from the three SJV subareas (Grasslands, Westlands, and Tulare/Kern). The Subarea committees assessed the progress toward, and constraints in, implementing recommendations of the *Management Plan*. The final reports of the subarea and technical committees were submitted to the Management Group in February 1999. Interested parties may contact the SJVDIP office at (916) 327-1630 for copies of these reports.

The second stage will synthesize information into a report that identifies interactions between drainage management options, trade-offs between management options, and a coordinated set of recommendations based on technical and economic considerations. A Coordinating Committee was formed in March 1999 to accomplish the goals of the second stage. The second stage report will be submitted to the Management Group in January.

The third stage will use the recommendations formulated during the second stage to identify acceptable mechanisms conducive to voluntary implementation of updated drainage management recommendations. The Management Group will decide on the scope and schedule of the third stage after the stage two report is complete.

For more information contact SJVDIP Coordinator Manucher Alemi at (916) 327 1630; e-mail malemi@water.ca.gov.



Water Legislation

Water-Related Bonds

Two water-related bonds will be on the March 2000 ballot: Proposition 13—the Safe Drinking Water, Clean Water, Watershed Protection and Flood Protection Act of 1999 (otherwise known as the "water bond") and Proposition 12—the Safe Neighborhood Parks, Clean Water, Clean Air and Coastal Protection Bond Act of 2000. The water bond has $1.97 billion for projects and the parks bond has $2.1 billion.

The water bond will make important improvements in water quality and flood control, and address CalFed Bay-Delta problems. The water supply benefits come from investments in watershed programs in Southern California, groundwater storage, water conservation and recycling, Bay/Delta management program, and other infrastructure and water quality management programs.

The parks and recreation bond focuses on open space infrastructure, including urban parks and watersheds. Land conservancies, water districts, cities, counties and various agencies would receive funds to repair and maintain existing parks, make new land purchases, and enhance water quality.

H.R. 623 (Knollenberg)

This bill, to amend the Energy Policy and Conservation Act to eliminate certain regulation of plumbing supplies, would strip the water efficiency standards from existing Federal Law (PL 102-486).

Water Conservation NEWS

Modesto Irrigation District Adopts New Plan

The Modesto Irrigation District hopes a new water management plan that the district adopted will help dispel the impression that agriculture wastes water. The water management plan is the result of a nine-year process that started with passage of the Agricultural Water Suppliers Efficient Water Management Practices Act of 1990. MID took a leadership role in working out details of a voluntary agreement by the State's agricultural water users to comply with the legislation, and in an agreement with the Department of Water Resources signed two years ago. The plan is the result of that agreement, and it spells out a variety of practices designed to save water. Practices include designating a water conservation coordinator, encouraging the use of recycled water, alternative land use—such as wildlife refuges, lining canals and ditches, and voluntary water transfers. For more information contact MID at (209) 526-6448.

New CIMIS Station

The Department of Water Resources' Southern District is cooperating with the Metropolitan Water District of Southern California and City of Monrovia on the installation of a new CIMIS station, number 159, in the City of Monrovia. Data collected by this station will be useful to water agencies seeking to administer landscape irrigation management programs in the northwestern section of the San Gabriel Valley in Los Angeles County. For more information contact David Inouye at (818) 543-4600; e-mail davidi@water.ca.gov.

City of Modesto Launches Cannery Segregation Project

The City of Modesto is moving in a new direction to support its economic development strategy with the creation of the Cannery Segregation Project. Approved by the Modesto City Council in October 1995 as part of the city's Wastewater Master Plan, the Cannery Segregation Project was developed to create capacity in the city's sewer system. Historically, the city's approach to collection and treatment has been to mix wastewater from local canneries with domestic sewage. Wastewater flow, particularly during canning season, has increased to the point that the existing treatment facilities are at or beyond their capacity. Because cannery wastewater is composed of organic vegetable matter, it does not need to be disinfected. The project will allow the cannery wastewater to be segregated into a separate pipeline, bypassing the primary treatment system. The organic vegetable matter is then mixed with water and directed to the city's "ranch," a secondary treatment facility for irrigation. The ranch land is pasture land for cattle. The field gets plowed shortly after the effluent is applied. The project consists of a primary plant headwork, cannery segregation pipeline, a parallel outfall pipeline and siphon, and irrigation improvements at the ranch. Full treatment of cannery wastewater has proven costly when compared with land application practices—quadrupling the plant load in the summer and using $1 million worth of electric power annually. The $32 million project was completed in August. For more information contact Bob Meleg at (209) 577-5300, or visit the city's Web site at www.ci.modesto.ca.us

BRIEFS

Water Conservation/Groundwater Recharge Application Period Closed

The Department of Water Resources is no longer accepting applications under the Water Conservation/Groundwater Recharge Loan Program authorized by the Safe, Clean, Reliable Water Supply Act (Proposition 204) because of an overwhelming response. DWR received 13 applications for Water Conservation and Groundwater Recharge construction and feasibility study loans requesting about $50 million. This figure far exceeds the $30 million available. Although DWR's Water Conservation/Groundwater Recharge program is oversubscribed, funding is still available under the Local Water Supply components of Propositions 82 (New Local Water Supply) and 204 (Local Projects). The Proposition 82 program provides water supply construction project and feasibility study loans. Under Proposition 204, construction loans and feasibility study grants for water supply projects are available. For further information regarding funding under these programs contact David A. Rolph, in DWR's Division of Planning and Local Assistance at (916) 445-8259 or e-mail him at drolph@water.ca.gov.

City of Fresno Holds Free Water Conservation Surveys

The City of Fresno is helping businesses and multi-family dwelling residents manage their water more efficiently. Upon request by telephone, a city conservation survey team visits customers' property without charge to help determine how they can save water. The team works with customers to determine areas in the home or business where they can save water. The evaluation can show the customer how much water is being used and how much can be saved with low-flow shower heads, ultra low-flow toilets, and other water-saving devices. Surveys are available to mutli-family dwellings, commercial and industrial sites, and commercial landscapes. The interior surveys include a water meter leak test; dye tablet leak detection in toilet tanks; toilet float adjustments to make sure the tank float is set at its proper height; shower flow rate tests and distribution of a high-efficiency low-flow showerhead; and detection of faucet leaks. Exterior surveys include soil analysis to determine absorption rate, soil compaction, water retention capability, moisture depth, root zone depth, and thatch build-up; and an irrigation system check-up of each station of in-ground systems for proper coverage. For more information on the program contact Dave Todd at (559) 498-4133. To schedule a survey Monday through Friday during working hours call (559) 498-1016. Or visit the Web site at www. ci. fresno.ca.us/public_ utilities/water_events.html.

American River Water Education Center at Folsom Dam

by Pete Vonich, U.S. Bureau of Reclamation

The U.S. Bureau of Reclamation's Mid-Pacific Region, with the Central California Area Office at Folsom, has opened its Water Education Center at Folsom Dam.

The Center is required by the Central Valley Project Improvement Act of 1992.

A partnership was established between the California Department of Parks and Recreation and USBR to construct and operate the Center.

The center highlights the American River watershed, where water comes from, how we have used it in the past, and how we need to use it in the future.

The plan was to build the Center where Folsom Dam tours meet. This was a grassy area of 1.5 acres. In keeping with Reclamation's guidelines of reuse and recycling, and because of limited funding, the partners built the facility using modular buildings from excess military sites; excess concrete blocks for siding; and soil for fill from swimming pool excavations.

Paint used on the exterior of the building was recycled; existing granite rocks were used in the construction of the amphitheater instead of using concrete; and many trees and shrubs were donated by the Sacramento Tree Foundation and Sacramento Municipal Utility District.

Solar panels to provide power came from Western Area Power Administration and SMUD at a fraction of their cost because of the visibility of the Center.

The Center has three components. The first are the displays, interactive demonstrations and xeriscape gardens which illustrate both the need to conserve and how to conserve.

The second component is a classroom which allows teachers to hold demonstrations, to help students learn about related resource topics such as water cycles and ecology.

The third component is the dam tour program. Visitors will learn about how USBR operates Folsom and Nimbus Dams including tours of the dam and power plant.

The Center's location within the City of Folsom and adjacent to the American River Recreation Trail is within easy walking and biking distance of 60,000 people.

The Center will be managed by the USBR, California State Parks and Recreation, volunteer groups, a State Park clerk, and tour guides. The Center opened on June 8, 1999.

For information on Center hours, tours, or directions contact (916) 989-7275 or (916) 989-7100.

L.A. PROPERTY FOR SALE?

Time to Upgrade Plumbing Fixtures

by Charlie Pike
Water Use Efficiency Office

The article "Flow Blows … Complying with Expanding Water-Survey Regulations" in the July 1999 edition of *California Real Estate Journal* caught the attention of DWR's Water Use Efficiency Office staff.

Authors Samuel H. Weissbard and Camellia K. Schuk reminded property owners that new ordinances require changes to existing buildings to conform with current Los Angeles Municipal Code requirements. They described the requirements for water conservation and limitation of wastewater using outdated information.

In their article, the authors used the showerhead flow and toilet flush numbers from the text of the municipal code. The resulting article erroneously stated that water closets must be limited to 3.5 (instead of 1.6) gallons per flush and urinals must be limited to 1.5 (instead of 1.0) gallons per flush. The new municipal code cited the ASME/ANSI A112.19.6M standard, but did not replace the old numbers in the text.

The notion of retrofit on resale is not new, but the City of Los Angeles updated the code in June 1998. Since the authors are in Irvine, in Orange County, they probably did not receive Tom Gackstetter's letter (from the Los Angeles Department of Water and Power) to all Los Angeles property owners alerting them about the new requirement.

One of the motivations for the City of Los Angeles to update the code was to reflect changing plumbing standards as set by the American National Standards Institute. The definition states that a "Low Consumption Closet as a water closet having average water consumption (total flush volume) less than or equal to 1.6 gal (6L) over the range of test pressures as specified for each closet type … "

The moral of this story is make it clear, correct, and specify the numbers as well as the current code.

New Publications

XERISCAPE—A world of beautiful possibilities!
This colorful brochure explains the 7 steps of xeriscape and why it makes sense to save water while gardening in arid regions. It is published as a guide to the Water Conservation Garden at Cuyamaca College in San Diego, California—a learning resource center with demonstration gardens displaying over 360 trees and nearly 100,000 square feet of landscaping. To get more information or a copy of the brochure, call (619) 660-0614; fax (916) 660-9707. For more information about the Water Conservation Garden, visit the Web site at www.thegarden.org. The garden operates as a non-profit organization and is designed to teach how to best use xeriscape-type landscaping.

Estimated Use of Water in the United States in 1995—(download the report in PDF format)
Every five years the U.S. Geological Survey compiles national water-use estimates and publishes a report. The latest report is Circular 1200, *Estimated Use of Water in the United States in 1995*. Using the Adobe PDF Reader program (available free from Adobe), you can download part or all of the report in Portable Document Format (PDF) from the USGS Web site at water.usgs.gov/public/watuse/pdf1995/html/.

New USGS Water Quality Publication
This U.S. Geological Survey report is the first in a series of nontechnical publications, *The Quality of Our Nation's Waters*, designed to describe major findings of the National Water-Quality Assessment Program regarding water-quality issues of regional and national concern. Sources, seasonal, and geographic patterns of occurrence, and long-term trends are evaluated for nutrients and pesticides in streams and groundwater and for pesticides in bed sediment and fish tissue from 20 major river basins and (or) aquifer systems across the conterminous United States. Implications of these national findings relative to water policies and strategies are presented. Issues discussed include relationships of nutrients and pesticides to natural features, land and chemical use, and resource-management practices; effects on human and aquatic health; considerations for development of water-quality standards; and approaches to modeling. For more information visit the USGS Web site at water.usgs.gov/wrd012.html.

FREE Water Educational Materials
To help teachers and educators develop classroom curriculum to teach students about the importance of water, the Department of Water Resources offers free water education materials. The water education materials available include teachers guides and student workbooks, resource materials, hands-on water activities, flannel board stories, colored wall posters, and more! These materials can be ordered online by filling out an online order form or by printing out a mail-in order form provided online. To view these materials, visit the Office

of Water Education "Water Facts & Fun" Web site at wwwdwr.water.ca.gov/dir-dwr_publicationsR2/dir-water_fact_fun_catalog/HTML/Homepage.html. For more information call (916) 653-6192.

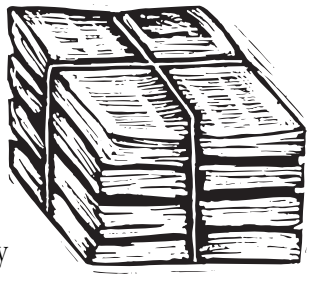
BMP 5 Handbook—A Guide to Implementing Large Landscape Conservation Programs

The goal of this handbook is to help California water agencies understand and administer landscape conservation programs in accordance with Best Management Practice 5. The audience is the "water conservation coordinator" responsible for implementing BMPs. The handbook provides BMP 5 definitions, implementation schedules, coverage requirements and reporting requirements; guidance and case studies about alternative ways to design, budget, promote, implement, administer, and monitor BMP 5 landscape water efficiency programs; and references that readers can contact to get more information. The handbook was funded by the California Urban Water Conservation Council. The cost is $25. For more information contact CUWCC at (916) 552-5885.

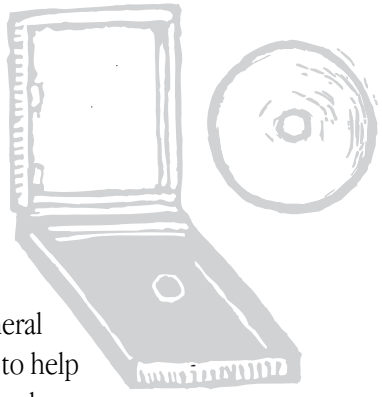
San Francisco Bay Area Regional Water Recycling Program—Regional Master Plan Update, May 1999

BARWRP is a partnership of partnership of San Francisco Bay Area water and wastewater agencies joined together with State and federal agencies to study the feasibility of using high-quality recycled water to augment water supplies and help the Bay-Delta ecosystem. The purpose of this update is to introduce significant "Master Plan" regional water recycling recommendations and to begin generating broad-based support for implementation. For more information contact Randy Raines, Program Coordinator, at (925) 299-6733.

The Value of Water, April 1999



Published by the National Water Research Institute, this document focuses on the real value of water—not necessarily its cost or price—but what it does to enhance the environment, economy, and quality of life of the general population. The goal is to help water agency decision makers recognize and use the full potential of their water supply. For more information contact NWRI at 10500 Ellis Avenue, P.O. Box 20865, Fountain Valley, CA 92728-0865; telephone (714) 378 3278; fax (714) 378-3375; e-mail NWRI-1@worldnet.att.net.



California: Land and Legacy by William Fulton, Westcliffe Publishers, 1998

On the eve of California's sesquicentennial and a new millennium, planner and best-selling author William Fulton has produced a timely examination of California's history from an environmental perspective. This book employs compelling text and over 100 stunning photographs by some of the state's best nature photographers to trace California's dramatic growth over the last 150 years and the impact such rapid change has had on the land and natural resources of the state ($50.00 hardcover). Available through Westcliffe Publishers.

State Water Project Atlas

Published by DWR, this new atlas shows major facilities of the 660-mile-long State Water Project. Through text, technical drawings and color photographs, the 194-page SWP Atlas gives a detailed view of the Project's features, including the tallest dam in the U.S. and almost 700 miles of canals and pipelines. The atlas is available now to water community members for $30, plus 7.75% sales tax and a $5 per book shipping charge. It will be available to the public in May for $50 (plus the sales tax and shipping charges). Sales are only by check or money order, payable to the Department of Water Resources. To request a copy contact California Department of Water Resources, ATTN: Imaging and Records Management, P.O. Box 942836, Sacramento, CA 94236-0001; Phone: (916) 653-1097.

Water Conservation Project Improving Rainbow Creek Water Quality

by **Arturo Carvajal, Water Use Efficiency Office**
Connie Chai, Mission Resource Conservation District

The U.S. Environmental Protection Agency awarded the Department of Water Resources a grant under the Pollution Prevention Incentives for States to develop an Agricultural Ecosystem Management Mobile Laboratory—Eco Lab. The pilot project is sponsored and administered by Mission Resource Conservation District. The services of the Eco Lab are provided to farmers in the Rainbow Creek watershed area at their request.

In its second year, the Eco Lab results are promising. One of its objectives is to monitor and reduce nitrogen in Rainbow Creek. Connie Chai, a biology graduate of University of California at Riverside, is leading this project. She said that farmers in the Rainbow Creek watershed area improve irrigation efficiency after they receive the irrigation system evaluation, and they receive recommendations on how to reduce soil erosion. Avocado growers are incorporating the Eco Lab recommendations, reducing stream sedimentation, phosphate runoff, nitrate deep percolation, and runoff. They are also learning about the advantages of on-farm composting.

Nitrate levels in Rainbow Creek have dropped from 100 ppm in 1997 to under 40 ppm in 1999. By integrating BMPs with improved irrigation management, Rainbow Creek stakeholders conserve water and prevent non-point source pollution. As an added incentive, there are savings in water bills. Water for farmers costs up to $500 to $600 per acre-foot in northern San Diego County.

The Eco Lab project will continue until 2000. For more information contact Arturo Carvajal at (916)327-1622; e-mail arturoc@water.ca.gov—or Connie Chai at (760) 728-1332; e-mail missnrcd@tfb.com.

Conservation Certification QUIZ

The California-Nevada Section of the American Water Works Association has developed a program to train and certify urban water conservation specialists. Water Conservation Level 1 Certification is the introductory level. The following questions address common water efficiency topics and are presented as practice exercises in the Level 1 class.

Species A has a plant factor of 0.7 and Species B has a plant factor of 0.35. What can you say about the water use of these plants?

a. Species A would die if watered like Species B.
b. Species A would use twice the water of Species B if grown under the same conditions.
c. Species B must be a cactus.
d. Species A is turfgrass so can not be replaced by Species B.

A tennis club has fifteen 3.5 gpm showerheads. An average of 1,515 people per week take showers for an average duration of 9 minutes per shower. If the heads are replaced with 2.5 gpm showerheads, what is the annual water savings, in gallons, if the showerheads are used at their maximum flow rates?

a. 13,365
b. 34,088
c. 364,000
d. 709,020

The Colorado River

a. collects water only from the states of Colorado, Utah, Wyoming, and New Mexico, but is used by many states including, California and Nevada.
b. is administered by the Secretary of the Interior.
c. is managed only by the Colorado Department of Water Resources.

With each program characteristic listed below, indicate whether it is more related to Short Term (ST) or Long Term (LT) programs.

_____ restrictions on watering days or times
_____ incentives for hardware installation that will stay in place for years
_____ allocations of water per account (rationing)
_____ program staff and budgets with multi-year plans
_____ penalty charges for excess water use
_____ programs go on even when it rains
_____ measures seen as developing alternate source of water supply

Which meter is most common is urban areas?

a. positive displacement
b. turbine
c. double-check
d. compound

Answers b, d, b, (ST, LT, ST, LT, ST, LT, LT), a

Water Conservation-Related

EVENTS

January 24-25

California Irrigation Institute's 38th Annual Meeting: "Irrigation in the 21st Century: *Who are the Players? What is the Game?*"

Radisson Hotel

Sacramento, California

—This two-day conference will provide state-of-the-art information on various issues facing irrigation and drainage in California. Department of Water Resources Director, Tom Hannigan, will be the opening speaker at the general session on the first day of the conference. Other opening session speakers include Mary Ann Dickinson, Executive Director of the Urban Water Management Council and Roger Reynolds, Co-chair of the Agricultural Water Management Council. This conference is the main activity of CII to educate those within and outside of the irrigation industry about all facets of irrigation in California. For more information, contact Jeanne Duncan at (916) 366-9376; fax (916) 366-1432.

January 30—February 2

American Water Works Association's Water Reuse 2000 Conference and Exposition

Hyatt Regency San Antonio Hotel

123 Losoya Street

San Antonio, Texas

—This conference and exposition will focus on new and inventive information on water reuse. Water professionals from across North America who are involved with reuse, recycling, conservation, quality and distribution will convene at this conference to gain new insights, share solutions, network with industry peers and discover new products and services. For more information contact David Rossiter at (303) 347-6209; e-mail rossiter@awwa.org; or visit the AWWA Web site at www.awwa.org/.

February 6-7

"Advancing Water Conservation Issues Through Effective Partnerships"

Holiday Inn (near Airport)

Salt Lake City, Utah

—This AWWA water conservation workshop is being held in conjunction with the Water Conservation Division Mid-Winter Meeting. For more information contact John Wright at (303) 347-6134; e-mail jwright@awwa.org.

February 14-15—Monrovia
February 17-18—Coachella (Palm Desert)

Leak Detection and Water Audit Workshops

—The cosponsors of these workshops are the Department of Water Resources, California Urban Water Conservation Council, City of Monrovia, Coachella Valley Water District, Metropolitan Water District of Southern California, US Bureau of Reclamation and ExPERT Inc. For registration information contact Mary Ann Dickinson of the CUWCC at (916) 552-5885; e-mail MADinLA@aol.com., or Sergio Fierro of DWR's Southern District at (818) 543-4601, extension 297; e-mail sergiof@water.ca.gov.

February 16-17

Landscape Industry Show

Long Beach Convention Center

Long Beach, California

—The Landscape Industry Show is the largest trade show on the west coast showcasing products and services for landscape and irrigation contractors. In its 21st year, the Landscape Industry Show expects 300 exhibitors and 4,500 to 6,500 attendees for the two-day event. For more information, contact Assistant Show Manager Kimmi Alexander at the California Landscape Contractors Association at (916) 448-2522; e-mail kimmialexander@clca.org.

February 29—March 3

Association of California Water Agencies Washington D.C. Conference

Washington Court Hotel
Washington D.C.

—For more information contact ACWA at 910 K Street, Suite 100, Sacramento, CA 95814-3512. The phone number is (916) 441-4545. The e-mail address is acwabox@acwanet.com. Also visit ACWA's Web site at www.acwanet.com/index1.html.

March 6

The Irrigation Association Certification Exam

Quails Inn Hotel
San Marcos, California

—This class is for landscape Contractor and Designer (Step 2 and Step 3) exams only. All participants should register at least one month before the exam date. For more information contact The Irrigation Association at certification@irrigation.org; or contact Elena R. Daly, IA Certification Manager, at (703) 573-3551; fax (703) 573 1913. Also visit the IA Web site at www.irrigation.org/ia/main.html.

April 12-14

National Water Resources Association Federal Water Seminar

Washington Court Hotel
Washington DC.

—For more information visit the NWRA Web site at www.nwra.org/newsite/.

ITRC Landscape Water Management Workshops

The Irrigation Training and Research Center's Landscape Water Management Program includes two-day Landscape Irrigation Auditor Training and one-day Landscape Water Budgeting workshops. The following workshops will be offered in February and May at the Santa Clara Valley Water District in Santa Clara:

Auditing Workshop: February 16 & 17, May 3 & 4
Budgeting Workshop: February 18, May 5

The Landscape Irrigation Auditor Training includes procedures for evaluating the performance of Sprinkler, Drip, Micro Spray and Bubbler Systems. The workshop concentrates on procedures for the collection and evaluation of data to develop irrigation schedules that are appropriate for the irrigation system and the landscape. Participants will conduct two audits during the workshop. The schedules developed from the audits will be discussed in detail.

The Landscape Water Budgeting workshop provides the tools to develop estimates of Water Budgets for existing or proposed landscape designs. The concepts covered in the one day work are very appropriate for the requirement of Best Management Practices 5 (BMP) which requires Water Use Budgets for CII landscape with dedicated water meters. The principles taught in the workshop are very useful in developing dollar estimates for the water needed to adequately irrigate and existing or proposed site design.

Workshop Fees
Auditing Workshop: $235; Budgeting Workshop: $95
Both workshops together: $295

For more information about the Santa Clara workshops contact Hossein Ashktorab at SCVWD at (408) 265-2607, extension 2291; e-mail hashktorab@scwd.dst.ca.us.

For information on other upcoming workshops, contact Susanne Gartner at ITRC at (805) 756-2434; Fax (805) 756-2433; e-mail sgartner@calpoly.edu; Web site www.itrc.org.

WATER CONSERVATION NEWS
P.O. Box 942836
Sacramento, CA 94236-0001

Address Correction Requested

CIMIS Network News

Did you know you can use the new CIMIS ETo zone map to develop a "normal" year turf irrigation schedule? To see an example of how it works, say for May through October, use the following facts:

1. You are in ETo zone 9.
2. Your irrigation system precipitation rate is 1.5 inches/hr.
3. Your irrigation system distribution uniformity is 70% (0.7).
4. You irrigate every third day.
5. You have cool-season turf grass.

As an example, calculate some numbers for the month of May. For ETo zone 9, the average ETo for May is 0.19 inches/day. Since you irrigate every three days, the ETo will be 0.57 inches every three days. Your turf ETc is calculated as: ETc = ETo x Kc. We will use a turf Kc of 0.96 for May, then ETc = 0.57 x 0.96 or 0.55 inches. The actual depth of water to be replenished is 0.55 divided by the distribution uniformity (.70). It comes to 0.78 inches for each irrigation. The run time is calculated as inches to apply divided by system precipitation rate, i.e.

$$= \frac{0.78}{1.5} \times 60 = 31 \text{ minutes each irrigation}$$

Note that 60 is used to convert the precipitation rate from hours to minutes. By using the same procedure, we get this table.

Month	ETo (inches/day)	3-day ETo	Kc†	ETc (inches)	ETc/DU	Run time per irrigation (minutes)
January	0.07	0.21	0.67	0.14	0.20	8
February	0.10	0.30	0.67	0.20	0.29	11
March	0.12	0.39	0.67	0.26	0.37	15
April	0.17	0.51	0.96	0.49	0.70	28
May	0.19	0.57	0.96	0.55	0.78	31
June	0.22	0.66	0.96	0.63	0.91	36
July	0.24	0.72	0.85	0.61	0.87	35
August	0.22	0.66	0.85	0.56	0.80	32
September	0.19	0.57	0.85	0.48	0.69	28
October	0.13	0.39	0.68	0.27	0.38	15
November	0.09	0.27	0.68	0.18	0.26	10
December	0.06	0.18	0.68	0.12	0.17	7

This table does not account for rainfall. Rainfall should be factored when calculating run time. Also, the table is based on average (normal) weather conditions. Deviations from average weather conditions can be monitored and adjustments made by observing current CIMIS ETo data.

† Richie, W. E., R.L. Green, and V.A. Gilbeault. 1997. California Turfgrass Culture, Vol. 47, Nos. 3 & 4.

Visit the CIMIS Web site at **wwwdpla.water.ca.gov/cgi-bin/cimis/main.pl**.